

What is claimed is:

1. A facsimile communication system comprising:
  - a facsimile device on a sender side;
  - a gateway device on a sender side connectable through a telephone line to said facsimile device;
  - a gateway device on a receiver side connectable to said gateway device on the sender side through a communication line to which a protocol being different from that applied to said telephone line is applied;
  - a facsimile device on a receiver side connectable to said gateway device on the receiver side through the telephone line to which the same protocol as applied to said telephone line is applied; and
- whereby said gateway device on the receiver side is provided with memory, to store data transferred from said gateway device on the sender side, used when said data is transmitted from said facsimile device on the sender side through both said gateway devices to said facsimile device on the receiver side, a monitoring circuit to monitor accumulated amounts of said data to be stored in said memory and an accumulated data amount calculating circuit operated to store, in said memory, amounts of data required to prevent communication failures between said gateway device on the receiver side and said facsimile device on the receiver side even when delays in communications develop prior to the start of transmission of said data from said gateway device on the receiver side to said facsimile device on the receiver side and operated to calculate said required amounts of data, and said gateway device on the receiver side is operated to start the transmission of said data to said facsimile device on the receiver side when said accumulated amounts of data to be monitored by said accumulated amount data calculating circuit exceed said

required amounts of data.

2. The facsimile communication system according to claim 1, wherein said gateway device on the receiver side calculates delays in communications in said communication line for every communication prior to the receipt of said data from said gateway device on the sender side and, when said gateway device on the receiver side judges that said communication failures may occur due to said calculated delays in communications, stores said required amounts of data in said memory based on said calculated delays in communications.
3. The facsimile communication system according to claim 2, wherein said delays in communications are calculated from expected delayed time data.
4. The facsimile communication system according to claim 2, wherein said gateway device on the receiver side judges, for every communication, whether said communication failures may occur or not based on not only said delays in communications but also a transmission rate in communications between said gateway device on the receiver side and said facsimile device on the receiver side.
5. The facsimile communication system according to claim 1, wherein said gateway device on the receiver side, when time elapsed after said facsimile device on the receiver side has completed a preparation for the receipt of data exceeds a predetermined threshold time being shorter than a threshold time for a communication breakdown set to communications between said gateway device on the receiver side and said facsimile device on the receiver side, regardless of whether the accumulation of required amounts of data in said

memory is completed or not, transfers said data stored in said memory in consecutive order to said facsimile device on the receiver side in order to prevent the breakdown of communications between said gateway device on the receiver and said facsimile device on the receiver side.

6. The facsimile communication system according to claim 1, wherein said data is compressed picture data.

7. The facsimile communication system according to claim 1, wherein said gateway device on the receiver side, when receiving a DCS signal showing a communication mode from said facsimile device on the sender side through said gateway device on the sender side, transfers said DCS signal to said facsimile device on the receiver side and, before receiving a CFR signal showing a confirmation of the completion of receiving preparation from said facsimile device on the receiver side which has responded to said DCS signal, returns another CFR signal used to receive said data from said facsimile device on the sender side through said gateway device on the sender side to said facsimile device on the sender side.

8. The facsimile communication system according to claim 1, wherein said gateway device on the receiver side, when receiving the DCS signal showing the communication mode from said facsimile device on the sender side through said gateway device on the sender side, transfers the DCS signal to said facsimile device on the receiver side and then sends a TCF signal used to check a receiving capability of said facsimile device on the receiver side to said facsimile device on the receiver side and, after completion of the transmission of said TCF signal, sends a new TCF signal to said facsimile device on the

receiver side before the time elapsed after said facsimile device on the receiver side has completed a preparation for receiving data exceeds said predetermined threshold time being shorter than a threshold time for a communication breakdown set to communications between said gateway device on the receiver side and said facsimile device on the receiver side, in order to prevent the breakdown of communications between said gateway device on the receiver side and said facsimile device on the receiver side during the accumulation of said required amounts of data.

9. A facsimile communication system comprising:

a facsimile device on a sender side;

a gateway device on a sender side connectable through a telephone line to said facsimile device;

a gateway device on a receiver side connectable to said gateway device on the sender side through a communication line to which a protocol being different from that applied to said telephone line is applied;

a facsimile device on the receiver side connectable to said gateway device on the receiver side through the telephone line to which the same protocol as applied to said telephone line is applied and, after receiving all the data to be sent from said facsimile device on the sender side for every communication through said gateway device on the sender side and said gateway device on the receiver side, operated to return a receiving confirming signal showing completion of the receipt to said facsimile device on the sender side through said gateway on the receiver side and said gateway device on the sender side, and

whereby said gateway device on the sender side, after receiving said all data to be sent to said facsimile device on the receiver side from said facsimile

device on the sender side and before receiving said receiving confirming signal from said facsimile device on the receiver side, sends a disconnection instructing signal instructing the disconnection of communications between said facsimile device on the sender side and said gateway device on the sender side to said facsimile device on the sender side.

10. The facsimile communication system according to claim 9, wherein said facsimile device on the sender side, when receiving said disconnection instructing signal, sends a communication ending signal showing a termination of communications to said gateway device on the sender side and wherein said gateway device on the sender side, when receiving said communication ending signal from said facsimile device on the sender side, makes a transmission of said communication ending signal to said facsimile device on the receiver side pending and when receiving said receiving confirming signal from said facsimile device on the receiver side, sends said communication ending signal to said facsimile device on the receiver side through said gateway device on the receiver side.

11. The facsimile communication system according to claim 9, wherein said data is compressed picture data.

12. The facsimile communication system according to claim 9, wherein said receiving confirming signal is a first MCF signal and wherein said gateway device on the sender side is provided with a first notifying section operated to send a second MCF signal to said facsimile device on the sender side when, before said gateway device on the sender side receives said first MCF signal from said facsimile device on the receiver side through said gateway device on

the receiver side, said gateway device on the sender side receives an EOP signal , which show that the transmission of all the data from said facsimile device on the sender side to said gateway device on the sender side has been completed, by predetermined number of times from said facsimile device on the sender side.

13. The facsimile communication system according to claim 12, wherein said second MCF signal contains said disconnection instructing signal instructing the disconnection of communications between said facsimile device on the sender side and said gateway device on the sender side as additional information.

14. The facsimile communication system according to claim 12, wherein said gateway device on the sender side is provided with a second notifying section operated to send a non-standard function signal (NSF signal) showing that said gateway device on the sender side has a capability of sending said second MCF signal to said facsimile device on the sender side prior to the receipt of said data from said facsimile device on the sender side.

15. The facsimile communication system according to claim 14, wherein said facsimile device on the sender side is provided with a notifying section operated to send, when receiving said NSF signal, a non-standard function setting signal (NSS signal) showing that said facsimile device on the sender side has a capability of receiving said second MCF signal.

16. The facsimile communication system according to claim 12, wherein said facsimile device on the sender side, when receiving said second MCF

signal, sends said DCN signal being the communication ending signal to the gateway device on the sender side to terminate communications and wherein said gateway device on the sender side, when receiving said first MCF signal after having received said DCN signal, sends said DCN signal to said facsimile device on the receiver side through said gateway device on the receiver side.

17. The facsimile communication system according to claim 12, wherein said facsimile device on the sender side is provided with a notifying section operated to send, when receiving said second MCF signal, a first DCN signal being the DCN signal used to notify the termination of communications between gateway device on the sender side and facsimile device on the sender side containing additional information, to said gateway device on the sender side.

18. The facsimile communication system according to claim 17, wherein said additional information contained in said first DCN signal includes information as to whether said facsimile device on the receiver side requests that the NSS signal being a confirmation notifying signal containing the information as to whether said gateway device on the sender side has received said first MCF signal after said gateway device on the sender side has disconnected communications between said gateway device on the sender side and said facsimile device on the sender side be returned to said facsimile device on the receiver side.

19. The facsimile communication system according to claim 17, wherein said gateway device on the sender side is provided with a second notifying section operated to send the NSS signal containing information as to whether

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said gateway device on the sender side has received said first MCF signal to said facsimile device on the sender side after the disconnection of communications between said gateway device on the sender side and said facsimile device on the sender side based on said first DCN signal and wherein said gateway device on the sender side, after receiving said first DCN signal, sends a second DCN signal used to terminate communications between said gateway device on the receiver side and said facsimile device on the receiver side to said facsimile device on the receiver side through said gateway device on the receiver side and then makes a call to said facsimile device on the sender side and, after having made the call, sends said NSS signal to said facsimile device on the sender side.

20. The facsimile communication system according to claim 17, wherein said facsimile device on the sender side is provided with a valid period setting section operated to set a valid period when said facsimile device on the sender side is able to receive the NSS signal containing information showing that said gateway device on the sender side has received said first MCF signal and wherein said facsimile device on the sender side, when receiving said second MCF signal, sends said first DCN signal with additional information added, to said gateway device on the sender side so that said gateway device on the sender side sends said NSS signal within said valid period to said facsimile device on the sender side.

21. The facsimile communication system according to claim 20, wherein said additional information is the information about said valid period.

22. The facsimile communication system according to claim 20, wherein

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said gateway device on the sender side is provided with a second notifying section and wherein said gateway device on the sender side, after receiving said first DCN signal together with said additional information, sends a second DCN signal used to terminate communications between said gateway device on the receiver side and said facsimile device on the receiver side to said facsimile device on the receiver side through said gateway device on the receiver side and then makes a call to said facsimile device on the sender side and, after having made the call, by using said second notifying section, sends said NSS signal to said facsimile device on the sender side.